



Storm Data and Verification Program Overview

NOAA's National Weather Service
Office of Climate, Water, and Weather Services
Verification Unit

Brenton MacAloney March 4th, 2005



Presentation Outline



Storm Data

- What is Storm Data?
- History of Storm Data
- Storm Data Entry and the StormDat Software
- Uses of Storm Data
- Future of the Storm Data Program

Verification

- Program Overview
- Matching of Events and Warnings
- Verification Data
- Products to be Verified in the Future



What is Storm Data?



 Storm data is the official collection of severe and unusual weather events.

 Event information contained in storm data is collected, quality controlled, and logged by forecasters at National Weather Service forecast offices (WFOs).



History of Storm Data



- 1850 Earliest known storm data reports
 - Data documented in memos by the military
- 1959 First NCDC published Storm Data publication
 - Data documented using typewriter
- 1993 First electronic version of storm data collection
 - Data documented using Corel WordPerfect 5.0 (DOS)
- 1996 StormDat program created
 - Data documented using Corel Paradox database software



Storm Data Entry and StormDat

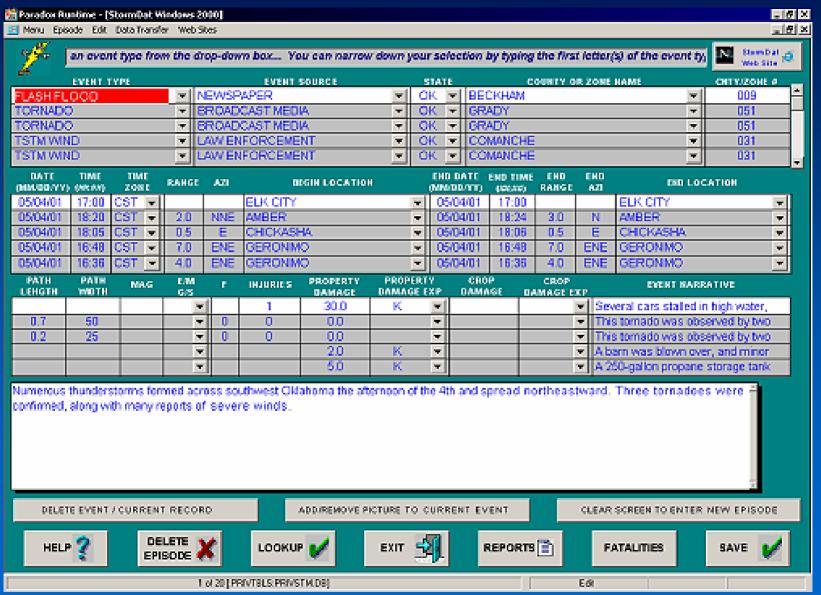


- Each of the NWS's 123 WFOs is responsible for collecting events. They collect these reports from:
 - Official NWS storm surveys
 - Emergency managers
 - Official NWS observations
 - Amateur radio operators
 - Newspaper clippings / Media outlets
 - Other sources
- Events are logged using the StormDat program
- WFOs have up to 60 days from the end of a month to transmit storm data to NWS HQ



StormDat Program Screen Capture







Fields Collected by StormDat



- Event Type (ex. tornado, winter storm, flood)
- Beginning and Ending Time
- Beginning and Ending Location (state, county, location)
- Report Source
- Event Magnitude (ex. hail size, tornado f-scale, wind speed)
- Injuries and Deaths Associated w/Event
- Crop and Property Damage Estimates
- Narrative Description of Event



Quality Control Features



- Finite list of severe and unusual weather events
- The StormDat program has an extensive quality control check when events are saved
- The StormDat program also runs a database integrity check on startup
- Event tracking numbers are used so events may be amended and/or deleted from the database



Uses of Storm Data



- NCDC's Storm Data publication
- SPC's official severe weather database (tornado, hail, wind)
- NWS's short fused warning verification statistics
- NWS's internal service assessments
- Army Corps of Engineers
- Academic research studies
- Disaster reports
- Congressional and other government data requests
- Public data requests



NCDC's Storm Data Publication



JANUARY 2001 VOLUME 43 NUMBER 01



AND UNUSUAL WEATHER PHENOMENA WITH LATE REPORTS AND CORRECTIONS



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NATIONAL CLIMATIC DATA CENTER

OUTSTANDING STORMS OF THE MONTH

1. Freezing Temperatures Reach Florida

Following a cold frontal passage across the Florida peninsula on December 31, 2000, a large high pressure system moved from Canada southward toward the Southeast U.S. and northern Gulf of Mexico. The surface high pressure system brought widespread sub-freezing temperatures to Florida in early January 2001. Also affected were the West-Central and Southwest portions of the peninsula. Temperatures remained below freezing for six to nine hours. Many locations reported temperature minimums in the middle twenties. Early damage estimates were at nearly five million dollars over West-Central and Southwest Florida.



Photo depicts a closeup of oranges encased in icicles shortly after sunrise on January 1. 2001. The orange tree was next to a strawberry field being sprayed with water to protect the crop from sub-freezing temperatures. This photo was taken in Dover, Florida.

(Photographs courtery of Fraser Hale, St. Petersburg Times Newspaper photographer.)



Right:

Photo shows a common scene across the interior portions of Florida in early January as farmers try to protect their crops.



NCDC's Storm Data Publication



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If you are interested in purchasing a subscription to the NCDC's Storm Data publication, please contact Stuart Hinson via e-mail at: Stuart.Hinson@noaa.gov

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)		ber of sons Injured	Estim Dam Property		January 2001 Character of Storm	
Document	Dute	Simula	(111103)	(Turus)	Imica	шушен	rroperty	сторз	ondered of Storm	
ALABAMA, Central										
Lowndes County										
Hayneville	19	0850CST			0	0	3K	0	Thunderstorm Wind (G50)	
		0905CST								
	Trees	and power lines v	vere blown	down near G	ordonsville	and in Ha	ayneville.			
Montgomery County										
Maxwell Afb	19	0919CST			0	0	10K	0	Thunderstorm Wind (G53) M	
	Wind was measured at 61 mph at Maxwell Air Force Base as a bow echo moved through the area.								he area.	
Montgomery County			-							
2.1 F Montgomery to	10	0922CST	2.3	100	0	4	450K	0	Tornado (F0)	



Future of Storm Data



- Over the new couple years the NWS plans on upgrading the StormDat program
- Planned enhancements:
 - turn the software into a web based program
 - map based entry screen (GIS)
 - upgrade database to mySQL
 - enhanced report generation
- Planned release: Late 2006



Verification Program Overview



- The NWS uses select events in storm data for the purpose of it's short fused warning verification program
- Short fused warning products verified:
 - Severe Thunderstorm Warnings (SVR)
 - Tornado Warnings (TOR)
 - Flash Flood Warnings (FFW)
 - Special Marine Warning (SMW)
- Events are matched with warnings and scores such as probability of detection, false alarm ratio, and event lead time are generated



Events Used for Verification

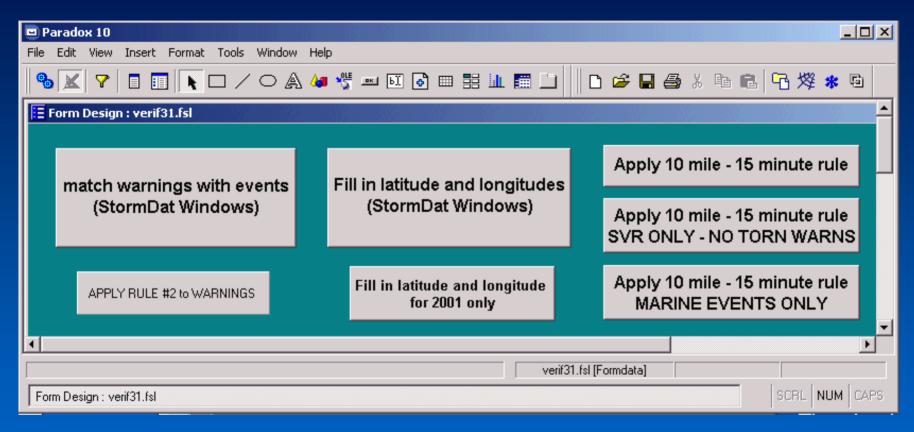


- Severe Thunderstorm Verification
 - 50kt winds and greater
 - ¾ inch hail
- Tornado Verification
 - all tornado events
- Flash Flood Verification
 - all flash flood events (not flood)
- Special Marine Verification
 - 34kt winds and greater over marine waters
 - ¾ inch hail over marine waters
 - waterspout events



Matching of Events and Warnings





- Matching of events and warnings is done on the first business day of every month.
- The matching process takes approximately 5-7 hours



Sample Verification Report



NATIONAL WEATHER SERVICE VERIFICATION / STORM DATA

VERIFICATION - SEVERE WEATHER - STATS ON DEMAND

NATIONAL WEATHER SERVICE SEVERE WEATHER STATISTICS

Period: 1/1/03 - 12/31/03

Summaries:

TORNADO WARNINGS ONLY TORNADO EVENTS ONLY TORNADOS ONLY TORNADOS ONLY Tomado events Tomado warnings issued 4023 1531 1212 Tornado warnings verified 1014 Tornado events warned Tornado warnings not verified 3009 Tornado events unwarned 319 13.5 False Alarm Rate (FAR) 748 Average leadtime Percent of events w/lead time > 0 71.7 Probability of Detection (POD) 792 Critical Success Index (CSI) 236



Sample Verification Report



NATIONAL WEATHER SERVICE VERIFICATION / STORM DATA

VERIFICATION - SEVERE WEATHER - STATS ON DEMAND

NATIONAL WEATHER SERVICE SEVERE WEATHER STATISTICS

Period: 1/1/02 - 9/13/04

Counties: PRINCE GEORGE'S(MD) - MONTGOMERY(MD)

Severe Local Storms Verification Report for: LWX - BALTIMORE/WASHINGTON, VA

TORNADO WARNINGS ONLY

			ISSUE	EXPIRE			TYPE	
YR	MTH	DAY	TIME	TIME	COUNTY	STATE	BASIS	VERIFICATION
2002	4	28	1702	1745	PRINCE GEORGE'S	MD	TORN-RAD	NOT VERIFIED
2002	5	13	1311	1345	MONTGOMERY	MD	TORN-PUB	NOT VERIFIED
2003	11	5	1421	1500	MONTGOMERY	MD	TORN-RAD	TORNADO
2004	5	25	1828	1930	PRINCE GEORGE'S	MD	TORN-RAD	NOT VERIFIED

TORNADO EVENTS ONLY

<u>YR</u>	MTH	DAY	TIME	COUNTY	STATE	EVENT	TIME	TYPE	LEADTIME
2003	11	5	1408	MONTGOMERY	MD	TORNADO		NOT VERIFIED	0
2003	11	5	1410	MONTGOMERY	MD	TORNADO	1421	TORN-RAD	0



Future of Verification



The NWS plans on creating verification statistics for the following products in the near future:

- Winter Storm Warnings and Watches
- High Wind Warnings and Watches
- Flood Warnings
- Coastal Flood Warnings

We will be using events logged in storm data for the purpose of verifying observations



Storm Data Program Overview



Contact Information

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